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# FOREST RESEARCH NEWS

## FOR THE SOUTH

March 1974

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SOUTHERN & SOUTHEASTERN FOREST EXPERIMENT STATIONS, USDA FOREST SERVICE

### What's New?

Notice anything special about this issue of FOREST RESEARCH NEWS? At first glance it may look pretty much like those you've been receiving about four times a year since 1968.

Oh, so you noticed the name change. Yes, it is now called FOREST RESEARCH NEWS FOR THE SOUTH instead of the MID-SOUTH. But a lot more is involved than a slight change in name.

Research done in one place often has regionwide, sometimes national applicability. With this issue, the Southeastern Forest Experiment Station, with headquarters at Asheville, North Carolina, joins the Southern Station, to make the newsletter a south-wide venture. We plan to bring it to you about six times a year.

News of research at the Southern Station's laboratories in six Midsouth States has been going to a wide audience in that area, including editors, newscasters, foresters, conservation groups, and owners and managers of tracts of land, both large and small.

Response has been very good. A great many editors have picked up items and relayed them to a public becoming increasingly concerned with natural resources. Some stories have been springboards for newspaper, magazine, and television features.

Now, outstanding research news from the five States in the Southeastern Station's area will also be reported in this bulletin, and copies will be distributed to editors and others in that area.

We hope the expanded coverage will bring more forest research news to more people more promptly than ever before, and we continue to invite your ideas and comments.

Isabel T. Duffy  
Public Information Officer  
Southern Forest Experiment Station

Application of paraquat induces resin saturation of the wood.



### Herbicide Increases Turpentine Production

Impossible as it may seem, treating pines with a substance developed to defoliate plants promises to increase profits for forest landowners in the South. Forest Service researchers, to whom the impossible is nothing more than a challenge, have discovered that applying the herbicide paraquat to a small area of the trunk of a slash or longleaf pine causes a large portion of the wood of the living tree to become saturated with resin. From this wood, rosin and turpentine can be extracted when the harvested tree is processed at the pulpmill.

Research at Olustee, Florida, by Donald R. Roberts and other Southeastern Forest Experiment Station scientists indicates that resin soaking of wood can be induced in slash and longleaf pines by removing a 1-inch square of bark and spraying once with an 8-percent solution of paraquat. The resin soaking extends to the center of the trunk and has been found as high as 17-1/2 feet above the wound in some slash pines and 30 feet in some longleaf pines. Alternatively, repeated applications of a 0.1-percent solution of paraquat to one-sixth of the tree circumference resulted in intense resin soaking for a short distance. Roberts estimates that one or two applications of 8-percent solution of paraquat to one-half the tree circumference

will induce resin saturation of half the volume of the trunk at least as high as 15 feet above the wound.

Turpentine and rosin are used in products as diverse as varnishes, printing inks, artificial flavors, perfumes, chewing gum, and medicines. Rosin and turpentine are extracted as by-products during the manufacture of woodpulp for paper, and the new process promises to increase output of these byproducts. Thus, resin saturation of wood has great potential for boosting the world's supply of critically needed chemicals by nonpolluting means. Roberts emphasizes, however, that further research is necessary before the process is ready for commercial application and that paraquat must still be registered by the Federal Government for use on pines.

Further information on the new process is available in two reports: Research Note SE-191 by Donald R. Roberts and a reprint from NAVAL STORES REVIEW entitled, "A New and More Efficient Method of Naval Stores Production," by Roberts and other researchers at Olustee. Copies can be obtained from the Southeastern Forest Experiment Station, P. O. Box 2570, Asheville, North Carolina 28802.



## Studying Preforestry on Scholarships

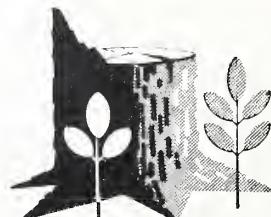


Preforestry students attending Tuskegee Institute in Alabama under scholarships provided by the Weyerhaeuser Company are, from left to right: Fred Henderson, Los Angeles, California; Anthony Smith, Seattle, Washington; Michael Heard, Chattanooga, Tennessee; Jo Anne Fowler, Hempstead, New York; Leon Foster, Greenville, Mississippi; Jerry McGhee, Talladega, Alabama; Genita Armstead, Seattle; Quenton Farr, Marvell, Arkansas.

The program began in 1968 through the cooperation of the USDA Forest Service and Tuskegee Institute. Only a very few blacks have been trained in forestry, a profession offering a wide variety of opportunities, especially in the South.

At Tuskegee minority students receive 2 years of preforestry training, leading to bachelor of science degrees in forestry, wildlife management, fisheries, outdoor recreation, or landscape architecture. They transfer to one of several cooperating universities for their final 2 years. Twenty students were enrolled in the program for the Fall semester of 1973, eight of them on Weyerhaeuser scholarships. Summertime work opportunities are provided on the National forests.

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# Mississippi's Industrial Timber Increases 39 Percent

Mississippi forests supplied more than 559 million cubic feet of roundwood to forest industries in 1972, an increase of over 39 percent since 1966.

Softwoods, mainly pine, made up more than two-thirds of the total. Pulpwood and saw logs were the major products, accounting for 85 percent of the harvest. Veneer logs added 11 percent, and poles and piling made up most of the remainder.

Although forest area has decreased 1 percent in the last 6 years, timber still occupies 16.7 million acres—more than half the State's land area.

These are some of the facts in two new USDA Forest Service publications released by Dr. John C. Barber, Director of the Southern Forest Experiment Station.

One is "Mississippi Forest Industries, 1972" by Daniel F. Bertelson of the Southern Station's Forest Resources Research Unit. Data for the report were provided by the Mississippi Forestry Commission, which canvassed all primary forest industries in the State. The report shows softwood and hardwood output by county, lists names and addresses of all primary forest industries, and maps plant locations, information useful to State and local agencies, planners, industrial developers, and Chambers of Commerce.

The other is "Midcycle Evaluation of Mississippi Timber Resources" by Dwane D. Van Hooser.

Normally, Southern Station researchers appraise each State's

forest resources every 10 years, Dr. Barber explained. But the dynamic growth of Mississippi's forest industries makes the 10-year cycle too long to wait. The new two-stage 3P sampling technique makes a midcycle evaluation possible, he said. Thus, Mississippi is the first State to have a midcycle update.

Overall change in the amount of forest land was small, because abandonment of some fields to forestry almost offset land clearing. Nevertheless, substantial shifts occurred in land use in some sections. In the Delta area, encompassing the alluvial plain of the Mississippi River and a lot of prime hardwood land, more than 14 percent of the commercial forest was cleared and planted, primarily to soybeans or cotton.

Here, heavy losses through clearing have been taking place since the early 1960's. If widespread clearing continues, and indications are that it will, Southern Station researchers predict impact on the hardwood resource may become even more severe in the next decade.

Net growth of softwoods in 1972 was 454 million cubic feet, exceeding softwood removals by only 6 percent. Six years ago, the margin of timber growth over cut was 10 times as great. If this trend continues, forestry must be intensified to support future expansions of Mississippi's forest industry.

Both reports are available from the Southern Forest Experiment Station, 701 Loyola Avenue, New Orleans, Louisiana 70113. "Mississippi Forest Industries, 1972" is Forest Service Resource Bulletin SO-43. The "Midcycle Evaluation of Mississippi Timber Resources" is Resource Bulletin SO-44.

*Forests still occupy more than half of Mississippi's land area.*



# FINDING DISEASE-RESISTANT PINES

For some time foresters have been searching for southern pines that are resistant to fusiform rust. They have had limited success—too many trees to test and too little time. But now researchers at the Southeastern Forest Experiment Station have taken the lead in developing a practical method for determining the resistance of large numbers of seedlings quickly.

Fusiform rust is the most troublesome disease of southern pines, and particularly of plantations. It attacks young trees, causing swellings called galls on the stems or trunk. A trunk gall either kills or seriously de-

forms the tree. Modern forest management practices that are designed to improve growth, such as site preparation and fertilization, increase incidence of rust. Furthermore, slash and loblolly pines, the favored species for planting in the South, are highly susceptible. Losses to fusiform rust are estimated at well over \$28 million per year, and they are steadily increasing.

The most promising way to control the disease is by developing resistant strains of pine. Some slash and loblolly pines are resistant and pass this characteristic on to their offspring. Since attacks are pri-

marily on young trees, recognizing resistance in a mature tree is quite difficult. The mature tree that is free of rust may have escaped the disease by chance. Its resistance must be demonstrated by exposing its offspring to the disease and seeing whether rust symptoms appear.

Southeastern Station scientists, working with a southwide advisory committee, have developed a practical method for exposing large numbers of pine seedlings to uniformly severe disease conditions. In a greenhouse, young seedlings are sprayed with a water suspension of spores of the fungus that causes the disease. The concentration of spores in the suspension is carefully controlled to be certain that each seedling is equally exposed to the disease. After they are sprayed, the seedlings are kept in the greenhouse, and symptoms begin to appear on susceptible individuals in about a month. The complete evaluation of resistance requires only about 6 months.

The Southeastern Area for State and Private Forestry adapted the research results and tested the system for practical application. The method is now being used at the Fusiform Rust Testing Center in Asheville, North Carolina, where 250,000 seedlings will be tested each year.

Information on testing for fusiform-rust resistance may be obtained from the Southeastern Forest Experiment Station, P. O. Box 2570, Asheville, North Carolina 28802.

*Fusiform rust galls on slash pine.*



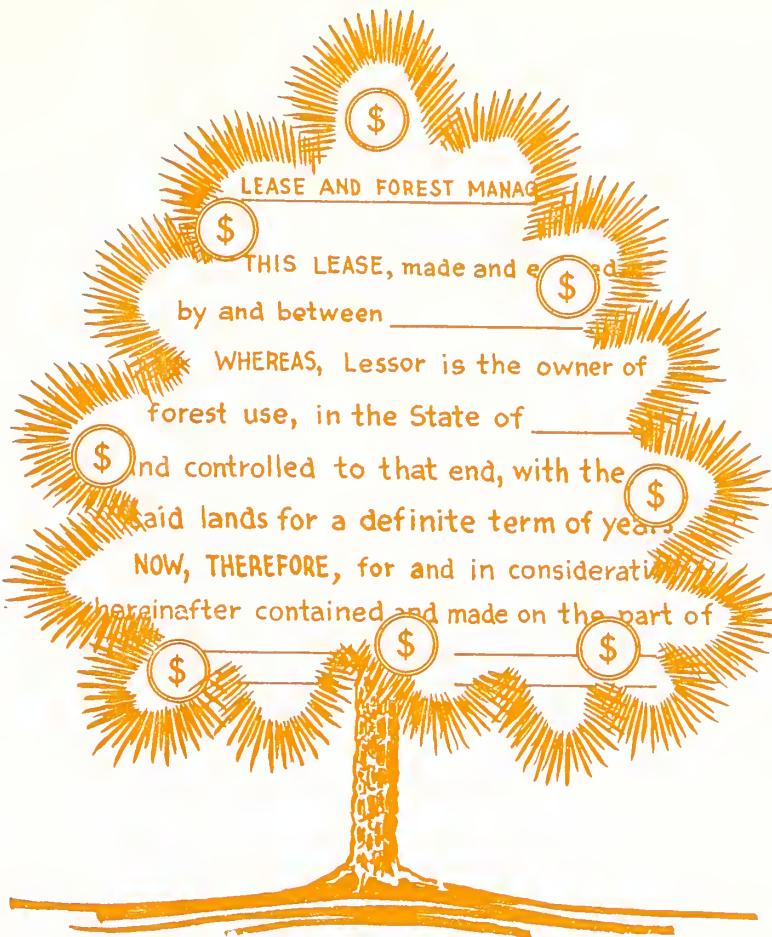
## Researcher Sees Trend To Long-Term Contracts

To help ensure a continuous supply of raw material, the South's wood-using industries are turning more and more to long-term contracts. There are a number of reasons for this situation.

Forest land values in the South have risen rapidly during the last two decades. In many areas external factors have supplanted timber production as the dominant consideration in pricing woodland. Because of existing or potential benefits from oil, gas, and mineral rights, some landowners are becoming increasingly reluctant to sell. Others tend to hold out for extraordinary gains in the indefinite future. Still others have no definite purpose but just do not want to give up their forest ownership. As a result, forest product firms striving to expand their holdings have often found prices to be beyond the payout capabilities of forestry. And large forest tracts are not often put on the open market.

For these reasons and others, few of the South's wood-using industries have acquired enough timberland in fee-simple ownership to supply their present and projected requirements for raw materials. The problem has been partially solved by long-term contracts providing various degrees of resource control without change of ownership.

William C. Siegel, principal economist for the Southern Forest Experiment Station, has researched existing contracts which have been negotiated by industry representatives with



*Long-term contracts will help ensure the South's wood-using industries a supply of raw material.*

nonindustrial private woodland owners. He reports his finding in *Long-Term Contracts For Forest Land And Timber In The South*.

Siegel studied the agreements of 54 firms. He found that between 1967 and 1970 long-term contract acreage in the South increased from 6.0 to 6.7 million acres. More than half of the 54 companies have at least 50,000 acres under contracts of various types. Most of the agreements have been written in the last 20 years.

Southern pine is the most prevalent timber type on contract acreage, but there are also substantial volumes of hard-

woods. Management ranges from very intensive to merely custodial. Two-thirds of the firms assume all management costs on contract woodlands.

Most agreements that provide for rental and stumpage payments contain economic adjustment indexes. A variety of arrangements are used to pay ad valorem taxes; to provide for losses by disaster, trespass, or theft; and to provide for condemnations and expropriations.

Siegel's study, Research Paper SO-87, may be obtained from the Southern Forest Experiment Station, 701 Loyola Avenue, New Orleans, Louisiana 70113.

# Oklahoma Shows Forest Industry Growth

Oklahoma's first complete canvass of forest industries reveals that the State supplied more than 64 million cubic feet of roundwood to wood-using plants in 1972.

Pine made up over three-fourths of the total. In terms of volume harvested, saw logs were the leading product, with pulpwood second. Veneer logs added 11 percent, and posts made up more than half the remainder. A total of 188 wood-using plants were in operation during 1972.

These are some of the findings appearing in a new research publication of the Southern Forest Experiment Station of USDA's Forest Service. It is "Oklahoma Forest Industries,

1972," by Daniel F. Bertelson.

The statewide coverage was undertaken at the request of C. Albert Engstrom, Director of the Forestry Division of the Oklahoma Department of Agriculture. Previous surveys in 1955 and 1965 had covered forest industries in only 17 eastern counties. In 1973 Forestry Division personnel visited all primary wood-using plants in the State and gathered data, which were compiled and analyzed by the Southern Station's Forest Resources Research Unit.

In 1972 the pulpwood harvest of 285,654 cords accounted for 36 percent of the State's timber harvest. This volume was more than triple the amount cut in 1971 and more than nine times

the harvest a decade ago.

More than 99 percent of the softwood harvest came from a five-county region in the southeast corner of the State. Hardwood output was concentrated in the eastern half of the State, but some counties in the west also contributed. McCurtain County had the most wood-using plants as well as the largest wood harvest—44 million feet, or more than two-thirds of the State total.

In 1962, Oklahoma had two pulpmills with a daily capability of 140 tons. In 1972, there were three mills with a capacity of 2,270 tons. Two mills, including the new one, are in McCurtain County, and in 1972 more than three-fourths of the pulpwood cut in the State came from this county. In fact, McCurtain's production for the year ranked second in the entire South. Southern Station researchers believe the harvest in southeastern counties will be further stimulated by opening of a new mill in Texarkana, Texas, and by expansion of a mill in Ashdown, Arkansas.

Of the 103 sawmills in operation, seven were large mills that cut a total of 166 million board feet during the year. They processed 83 percent of the lumber manufactured in Oklahoma. More than 99 percent of their output was softwood. The other 96 sawmills were classified as small, individually cutting less than 3 million board feet annually. Of the 33 million board feet they processed, 81 percent was hardwood.

Copies of the Oklahoma report are available from the Southern Forest Experiment Station, 701 Loyola Avenue, New Orleans, Louisiana 70113. Ask for Resource Bulletin SO-45.

*Pulpwood harvest accounted for 36 percent of timber cut in Okla. in 1972, triple the amount of the previous year.*



# *Alabama Timber Volume Up, Forest Acreage Declines*

While forest area in Alabama declined 2 percent between 1963 and 1972, softwood timber volume increased 30 percent and hardwoods increased 15 percent, according to the latest USDA Forest Service survey of the State's timber resources.

Loss in forest area, which now totals 21.3 million acres and occupies 65 percent of the State, was due principally to clearing woodlands for pasture. Further declines are anticipated.

Information from the new survey has been published by the Southern Forest Experiment Station in Resource Bulletin SO-42, "Alabama Forests: Trends and Prospects," by Paul A. Murphy.

The volume of softwood growing stock—that is, trees presently or potentially suitable for sawtimber—is 11.3 billion cubic feet, an increase of 30 percent over 1963. About 93 percent of the softwood growing stock is pines. The softwood sawtimber inventory also increased 30 percent, and has improved in quality.

In contrast, hardwood growing stock increased only 15 percent, and no improvement in hardwood sawtimber quality was detected. Murphy noted that the small increase and lack of improvement in timber quality do not bode well for hardwood industries that depend on factory lumber logs.

Ownership patterns have not changed substantially since 1963. Most forest land is still privately owned.

Pulping capacity at mills in the State has more than doubled

since 1962. Of timber harvested in 1972, 91 percent went into saw logs or pulpwood.

There are now six pine plywood plants in Alabama. From virtually nothing in 1962, output of softwood veneer logs rose to 221 million board feet in 1971. By contrast, hardwood veneer-log production dropped 44 percent to 57 million board feet.

While Alabama still enjoys a comfortable margin of timber growth over timber cut, 65 percent of the State's forests are

less than fully stocked. Almost 10 million acres suitable for growing pine are stocked with pure or mixed hardwood stands. And one of every five hardwood trees 5 inches in diameter and larger is a cull.

Murphy thinks that Alabama's forest industry will increase in size. Improving hardwood stands and converting unproductive upland hardwood stands to pine can help the State's forests meet the increased resource demands in the years ahead.

A copy of Murphy's report is available from the Southern Forest Experiment Station, 701 Loyola Avenue, New Orleans, Louisiana 70113.

*Improving hardwood stands can help Alabama forests meet increased demands in the future.*



# Lumber Industry Wages, Efficiency On Upswing

Wages in the lumber industry are on the upswing in the South and improved efficiency has brightened the employment picture.

The trends are discussed in two Southern Forest Experiment Station publications. Lloyd C. Irland has researched *Labor Trends in Southern Forest Industries, 1950 to 1969*. James E. Granskog and Sam Guttenberg authored *Employment Trends in Southern Forest Industries*.

Forest industries provided only 2.4 percent of southern personal income in 1969, Irland reports. But their importance was not reflected in that statistic. The South accounts for 32 percent of workers employed in lumber, paper, and furniture manufacturing in the United States. These industries employ 13 percent of the southern manufacturing work force and pay 12.4 percent of total earnings in manufacturing. Southern forest industries had a better productivity record from 1950 to 1969 than the national average. The result has been a closing of the income gap between North and South. The paper industry, which pays high wages and has grown rapidly in the South, has provided a strong boost to employment and incomes in rural areas.

Improved efficiency and new product development resulted in a major shrinkage of employment in the lumber industry during the decade from 1958-1967. However, the loss of jobs was part of a long-term trend, and regionwide investment in forest

improvement have opened the door to employment growth. Granskog and Guttenberg discuss these factors in their article.

Now, they say, timber stands have been built up in both quantity and quality. New plants therefore can be built, and will expand employment in manufacturing. Advances in technology allow utilization of small trees, thereby shortening the time span for possible expansion. A prime example of future prospects has been the emergence and rapid growth of the softwood plywood industry.

In timber management, the easy tasks have largely been accomplished. Thus, continued improvements of the forest resource will require larger inputs of manpower.

Copies of both articles are available from the Southern Forest Experiment Station, 701 Loyola Avenue, New Orleans, Louisiana. 70113.

## Be Safe From Insects

Insect pests can spoil a hike, picnic, or camping trip—unless one takes protective measures such as those outlined in a new USDA publication.

The booklet, prepared by entomologists of USDA's Agricultural Research Service, points out that there are two types of repellent materials. The first type consists of general-use materials, which may be applied to both skin and clothing. The second type is comprised of limited-use repellents, that may be applied only to clothing.

Included are sections on repelling mosquitoes, biting flies, gnats, chiggers, fleas, and ticks. Mechanical methods such as screens and bed nets are also described. In addition, the bulletin tells how to deal with bites from insects you didn't succeed in repelling.

Single copies of Home and Garden Bulletin 200, "Be Safe from Insects in Recreation Areas," may be purchased for 20 cents from the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.

## POLLUTION—Can Your Trees Take It?

Home gardeners and landscapers have a new worry. Particularly in cities, they must take precautions against damage to their plants by air pollution.

To help them, the USDA Forest Service has issued a booklet, "Trees for Polluted Air."

It describes the effects of common air pollutants from factories and cities on shade, ornamental, and forest trees. It lists responses of both hardwood and softwood trees to specific pollutants. If you have to live in a smog-filled area, the booklet may help you select trees most resistant to pollutants.

Dr. Leon S. Doeringer of the Northeastern Forest Experiment Station in Upper Darby, Pennsylvania, compiled the information.

Identified as Miscellaneous Publication No. 1230, USDA Forest Service, the booklet is available for 25 cents a copy from the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.